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IS 4076 (1983): Hard brass wires for springs and other special purposes [MTD 8: Copper and Copper Alloys]

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Indian Standard
SPECIFICATION FOR
BRASS WIRES FOR SPRINGS AND
OTHER SPECIAL PURPOSES

(*First Revision*)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR
HARD BRASS WIRES FOR SPRINGS AND
OTHER SPECIAL PURPOSES

(First Revision)

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Indian Standard
SPECIFICATION FOR
HARD BRASS WIRES FOR SPRINGS AND
OTHER SPECIAL PURPOSES
(First Revision)

0. F O R E W O R D

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 28 October 1983, after the draft finalized by the Copper and Copper Alloys Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 This standard was first published in 1967. In view of the experience gained during the subsequent years, it was decided to revise this standard keeping in view the manufacturing and trade practices followed in the country in this field. In this revision, the following modifications have been made:

- a) MKs Units have been changed to SI Units for all quantities and dimensions.
- b) Reference to latest version of other standards have been made wherever necessary.
- c) A clause on terminology has been added.
- d) Requirements for chemical composition, sampling and criteria for conformity, and packing have been modified.
- e) Appendix A dealing with 'Information to be given by the purchaser' has been deleted.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for rounding off numerical values (revised).

1. SCOPE

1.1 This standard covers the requirements for round brass wires in coils suitable for use as hard wire as for springs.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definition as given in IS : 3288 (Part I)-1981* shall apply.

2.1 Wire — Rolled, extruded or drawn product of solid section of uniform cross-section along its whole length and the distance between two parallel faces not exceeding 6 mm; may be supplied in straight length or in coils or in spools.

3. SUPPLY OF MATERIAL

3.1 General requirements relating to the supply of material shall conform to IS : 1387-1967†.

4. CHEMICAL COMPOSITION

4.1 The material shall have the chemical composition as given in Table 1.

TABLE 1 CHEMICAL COMPOSITION

CONSTITUENT	PERCENT
Copper	63-66
Lead, <i>Max</i>	0·05
Iron, <i>Max</i>	0·10
Total impurities, <i>Max</i>	0·30
Zinc	Remainder

4.2 The chemical composition shall be determined either by the method specified in IS : 3685-1967‡ or any other established instrumental/chemical method. In case of dispute the procedure specified in the latest edition of IS : 3685‡ for chemical analysis shall be the referee method.

*Glossary of terms for copper and copper alloys: Part 1 Cast form and wrought form (main types) (second revision).

†General requirements for the supply of metallurgical materials (first revision).

‡Methods for chemical analysis of brasses.

5. MECHANICAL PROPERTIES

5.1 Tensile Test — The material when tested in accordance with IS : 2656-1964* shall have the tensile properties as given in Table 2.

TABLE 2 TENSILE PREPERTIES

Over mm	Up to and Including mm	TENSILE STRENGTH	
		Min MPa	Max MPa
(1)	(2)	(3)	(4)
0.5	1	785	885
1	2	745	825
2	6	695	775

NOTE — 1 MPa = 0.102 kgf/mm².

5.2 Wrapping Test — The wire in the condition as supplied when wrapped round a wire of its own diameter, in accordance with IS : 1755-1983† to form a close helix of eight turns and then subjected to unwrapping of six turns, shall not break.

6. FREEDOM FROM DEFECTS AND FINISH

6.1 The wire shall be clean, smooth, uniform in diameter, free from segregation, cracks, twists and kinks and shall lie flat in coil.

6.2 The wire shall be finished by such cold drawing and annealing operations as would produce the required temper and surface finish as agreed to between the purchaser and the supplier.

7. TOLERANCES ON DIAMETER

7.1 The tolerances on the diameter shall be in accordance with IS : 9861-1981‡.

7.2 Where tolerances other than these are required, those shall be subjected to agreement between the purchaser and the manufacturer.

*Method of tensile testing of copper and copper alloy wire.

†Method for wrapping test of wire.

‡Dimensions for wrought copper and copper alloy wires for general engineering purposes.

8. SAMPLING AND CRITERIA FOR CONFORMITY

8.0 Unless otherwise decided by mutual agreement of the purchaser and the supplier, the following sampling procedure and criteria for conformity shall hold good.

8.1 Lot — In any consignment all the coils of wire of the same size and temper and manufactured under similar conditions of production shall be grouped together to constitute a lot. However, a lot shall not exceed 1000 kg in mass. If necessary two or more lots shall be formed on the basis of the mass of the consignment.

8.2 Each coil of wire shall be examined from the lot for freedom from defects and for tolerance on diameters. Any coil found defective shall be rejected.

8.3 For chemical composition, one test shall be conducted for each 200 kg of wire or part thereof in the lot. For this purpose, necessary number of coils shall be selected at random in accordance with IS : 1817-1961*. One test shall be conducted for chemical analysis from each of the coils selected.

8.3.1 If the results of chemical analysis as obtained for each of the constituents satisfy the corresponding requirements, the lot shall be considered as conforming to the chemical requirements of the specification.

8.3.2 If a test result of chemical analysis fails to satisfy the requirements for any of the constituents, two more tests for that constituent shall be done on the same sample in order to confirm that the analysis has been done properly. If both the test results satisfy the relevant requirements the lot shall be considered as conforming to the specification, otherwise not.

8.4 The number of sample for mechanical test (tensile test, wrapping test) shall be at the rate of one per every 50 kg or part thereof in the lot.

8.4.1 The lot shall be considered as conforming to the requirements of the mechanical tests if all the test results on different samples satisfy the corresponding requirements.

8.4.2 If the test results on any sample for mechanical tests fail to satisfy the requirements for any of the mechanical properties, two more tests shall be done on sample collected from the same coil. If both the test results satisfy the relevant requirements, the lot shall be considered as conforming to the specification, otherwise not.

*Methods of sampling iron-ferrous metals for chemical analysis.

9. PACKING

- 9.1** The wires shall be coiled carefully and each length of wire shall be made up into a separate coil weighing up to 50 kg.
- 9.2** The inner diameter of coils depending on size of the wire shall be subject to agreement between the purchaser and the supplier.
- 9.3** The coils shall be suitably packed to avoid damage during transit.

10. MARKING

- 10.1** Suitable tags and labels with marking made on them to show the lot number, size and net mass of wire, and temper of the material in addition to name of the manufacturer and any such information required by the purchaser, shall be attached to each coil of the material.

10.2 BIS Certification Marking

The product may also be marked with Standard Mark.

- 10.2.1** The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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AMENDMENT NO. 1 JUNE 2004
TO
IS 4076 : 1983 SPECIFICATION FOR
BRASS WIRES FOR SPRINGS AND OTHER SPECIAL
PURPOSES

(First Revision)

(Page 4, clause 2.0, line 2) — Substitute 'IS 3288 (Part 3) : 1986' for 'IS 3288 : (Part I) - 1981*.*

(Page 4, footnote marked '') — Substitute the following for the existing footnote:*

*'*Glossary of terms relating to copper and copper alloys : Part 3 Wrought forms.'*

(Page 4, clause 3.1, line 2) — Substitute 'IS 1387 : 1993†' for 'IS : 1387 - 1967†'.

(Page 4, footnote marked '†') — Substitute the following for the existing footnote:

'†General requirements for the supply of metallurgical materials (second revision).'

(Page 5, clause 5.1, line 2) — Substitute 'IS 1608 : 1995' for 'IS : 2656 - 1964*'.*

(Page 5, footnote marked '') — Substitute the following for the existing footnote:*

*'*Mechanical testing of metals — Tensile testing (second revision).'*

(MTD 8)